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REPORT OF FIELD INVESTIGATION AND CONFERENCE ON THE IRRIGATION WATER SYSTEM - U.S. PENITENTARY, LEAVENWORTH, KANSAS

PUBLIC HEALTH SERVICE, KANSAS CITY, MISSOURI

9 AUGUST 1949

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The need for changing the source of irrigation water, used at a prison farm, from the Missouri River to an underground source is analyzed. Problems related to the current use of river water are discussed. It is concluded that water derived from an underground source offers the best solution.

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MISSOURI RIVER BASIN OFFICE
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REPORT OF FIELD INVESTIGATION AND CONFERENCE ON THE IRRIGATION WATER SUPPLY - U. S. PENITENTIARY, LEAVENWORTH, KANSAS
August 9, 1949

INTRODUCTION

Pursuant to a request through the Office of the Regional Medical Director, Region No. 7, Public Health Service, by Dr. K. M. Janney, Chief Medical Officer, United States Penitentiary, an investigation was made by S. A. Sanitary Engineer (X) K. S. Kramer to determine the need for changing the source of irrigation water used at the prison farm from the Missouri River to an underground source. Dr. Janney and Mr. Hunter, Chief Clerk, were interviewed during the course of the investigation.

FIELD OBSERVATIONS AND DATA

The prison farm truck garden consists of a twenty-five acre tract lying on the east side of the Missouri River. The area is about 100 yards from the river and protected from flooding by a dike. The garden area is immediately south of the Highway 92 bridge across the Missouri River. The area is composed of a silt loam underlaid with sand.

Various types of truck crops are grown here for consumption at the prison. Cabbage, tomatoes, carrots, potatoes, beans, and lettuce are grown in considerable quantities. It becomes necessary to irrigate the land almost every year in order to obtain a satisfactory harvest of the above-mentioned truck. Irrigation usually begins about the first of July, depending, of course, on the availability of rainfall. Irrigation of this area with river water was first begun about ten years ago. The area is equipped with overhead type sprinkling apparatus. The water is applied at the rate of about one inch per acre in five hours. About three acres are watered at a time. This requires a flow of about 300 gallons per minute and a pressure of about thirty pounds per square inch at the pump site.

The use of river water has caused several problems that have been difficult to deal with properly. One of the principal ones has been the removal of the river silt from the leafy vegetables such as lettuce and cabbage. The deposits of silt on the leafy vegetables is not only an aesthetic problem but is also potentially dangerous to the health of the consumer. It is known from bacteriological investigations of the water above Kansas City, that the coliform bacteria are present in the river water in far greater

numbers that can be considered as a safe maximum limit. In the absence of an accepted bacteriological standard for irrigation waters, it appears reasonable to assume and use the same standards that have been developed for sources of water supply for treatment plants consisting of sedimentation, chemical precipitation, filtration, and chlorination. Such a standard would be more lenient than those now in effect in certain states. In a report prepared for the Omaha District, Corps of Engineers, by H. Leibmann, Sanitary Engineer, Public Health Service, it is noted that the average coliform count of five samples of river water taken above Kansas City during the month of December, 1942, was 80,500 organisms per 100 ml. of water. This average number would exceed by four times the recommended average maximum limits as previously stated. Since the coliform organism is one of the indicators of pollution, it may be seen that the use of water containing large numbers of coliforms is potentially dangerous. It has not been shown conclusively that epidemics result from the consumption of vegetables contaminated in this manner; however, the absence of such epidemiological data does not exclude the possibility that it is dangerous, particularly when so much silt is deposited along with the organisms.

Another problem encountered with the present method of irrigation is the maintenance of equipment. The muddy water causes excessive wear on the pump and the pipes and nozzles plug frequently.

Underground water would alleviate the public health hazard involved in the consumption of vegetables grown on the prison farm. It would also supply an answer to the silting and maintenance problems. It will be necessary, however, to check the mineral content of the ground water carefully in order to determine whether the mineral matter it contains will be accumulative in nature to such an extent that the productivity of the soil in the area is reduced. Recommendations in this regard can be obtained from state or regional offices of the Geological Survey. It is unlikely that water obtained from the immediate river sands will contain unduly large quantities of such minerals. Deeper well water may contain enough mineral matter to make it unsuitable for irrigation purposes.

CONCLUSIONS

In view of the several problems connected with the use of water pumped from the Missouri River for irrigation purposes, it is concluded that water derived from an underground source offers the best solution. It is conceded that there is no epidemiological evidence to support the health aspects of this conclusion. However, since it is known that the Missouri River is quite

highly contaminated with coliform organisms, such a condition appears logical. It is believed that sufficient water for irrigation purposes can be readily obtained very economically from the relatively shallow river sands. Sand water might also be used for fire protection and stock watering. It would not be advisable to use it for human consumption without further treatment.

[redacted]
S. A. Sanitary Engineer (X)

APPROVED:

[redacted]
Senior Sanitary Engineer
Officer in Charge

MISSOURI RIVER BASIN OFFICE
PUBLIC HEALTH SERVICE
KANSAS CITY, MISSOURI

REPORT OF FIELD INVESTIGATION AND CONFERENCE ON THE IRRIGATION WATER SYSTEM - U. S. PENITENTIARY, LEAVENWORTH, KANSAS
August 9, 1949

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Pursuant to a request through the Office of the Regional Medical Director, Region No. 7, Public Health Service, by Dr. H. M. Janney, Chief Medical Officer, United States Penitentiary, an investigation was made by S. A. Sanitary Engineer (R) K. S. Krause to determine the need for changing the source of irrigation water used at the prison farm from the Missouri River to an underground source. Dr. Janney and Mr. Santee, Chief Clerk, were interviewed during the course of the investigation.

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Keith S. Krause

KEITH S. KRAUSE
S. A. Sanitary Engineer (E)

APPROVED:

Glen J. Hopkins

GLEN J. HOPKINS
Senior Sanitary Engineer
Officer in Charge

copy

FEDERAL SECURITY AGENCY

U. S. PUBLIC HEALTH SERVICE

UNITED STATES PENITENTIARY

Leavenworth, Kansas

August 15, 1949

MEMORANDUM

To: The Regional Medical Director
2200 Fidelity Building
911 Walnut Street
Kansas City, Missouri

Subject: Irrigation Water System - U. S. Penitentiary, Leavenworth, Kansas

This is to acknowledge receipt of "Report of Field Investigation and Conference on the Irrigation Water System - U. S. Penitentiary, Leavenworth, Kansas, August 9, 1949," and to advise that the information contained therein has been forwarded to proper administrative officials of the institution for their information and use. You will probably hear directly from Warden Hunter concerning the report within a few days.

I believe that the information is precisely what was needed in connection with possible health hazards from use of Missouri River water for irrigation of vegetable crops for consumption by the inmates of this institution. The data submitted will be used in preparation of justification for expenditures necessary in sinking a well for irrigation, and I appreciate the promptness of your office in submitting the report, as time was an important factor.

/s/
H. M. Janney
Medical Director, PHS
Chief Medical Officer

file

Kansas City, Missouri

Regional Medical Director
2200 Fidelity Building
911 Walnut Street

August 12, 1949

MEMORANDUM

TO: Medical Director Harold M. Janney
U. S. Penitentiary
Leavenworth, Kansas

SUBJECT: Irrigation Water System - U. S. Penitentiary, Leavenworth, Kansas

There is transmitted herewith in triplicate "Report of Field Investigation and Conference on the Irrigation Water System - U. S. Penitentiary, Leavenworth, Kansas, August 9, 1949" prepared by S. A. Sanitary Engineer (R) Keith S. Krause and approved by Senior Sanitary Engineer Glen J. Hopkins.

It is believed that Mr. Krause has thoroughly investigated the problem as it was presented to him and that his conclusions and recommendations are quite sound from the public health viewpoint. We presume that the question which he has treated is the one which you had in mind. However, considering the fact that your request was by telephone and that it reached this office in a rather round-about method, we cannot be certain. If we can be of any further assistance, please feel free to call upon us.

CHARLES P. BLANKENSHIP
Regional Medical Director

cfb/lk
cc: Glen J. Hopkins

Regional Medical Director
Public Health Service, Region VII

August 12, 1949

Officer in Charge, Missouri River Basin Office

Irrigation Water System - U. S. Penitentiary, Leavenworth, Kansas

There are attached hereto four copies of a Report of Field Investigation of the Irrigation Water System, U. S. Penitentiary, Leavenworth, Kansas, as requested by Dr. E. H. Janney, Chief Medical Officer, on August 8, 1949, through Senior Surgeon Claude D. [illegible], Jr.

It is apparent that Dr. Janney is desirous of obtaining an endorsement of a plan for improvements of facilities at the penitentiary. While the primary interest is not one of public health, I feel confident that we as public health people can endorse the development of a more satisfactory system of irrigation for the prison truck farm.

I believe it appropriate that further action in endorsing or transmitting the attached report should be a function of the Regional Medical Director. It would be appreciated, therefore, if you would give this matter your attention and take such action as you deem advisable to conclude the request.

We would, of course, appreciate being advised as to the action taken. A copy or copies of the report may be retained for the files of the Regional Office if such is desired.

GLEN J. HOPKINS
Senior Sanitary Engineer
Officer in Charge

Attachments - 4

GJH:VG